

2004 VIRGINIA TOXICS RELEASE INVENTORY (TRI) REPORT

March 2006

TRI

**Summary of Data
from 2004 Industry Reports**



DEQ POLICY AND PROGRAMS

It is the policy of the Virginia Department of Environmental Quality to protect the environment of Virginia in order to promote the health and well-being of the Commonwealth's citizens. To this end, the Department implements numerous programs, as described on the Department's website at <http://www.deq.virginia.gov/programs/homepage.html>. These range from media programs on Air Quality, Water Quality, and Waste Management, to area programs (such as the Chesapeake Bay Program and the Virginia Coastal Program), to more specific programs (such as Small Business Assistance and Citizen Monitoring), and others too numerous to set out here. The Department is committed to pollution prevention and elimination or reduction of waste at the source of generation. Pollution prevention programs include the Virginia Environmental Excellence Program and Businesses for the Bay. All parts of the agency and other sectors of government, all Virginia businesses and industry, and all Virginia's citizens have a role in managing and controlling the release of toxic chemicals in the Commonwealth.

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Executive Summary

2004 Virginia Toxics Release Inventory (TRI) Report

In March of each year, the Virginia Department of Environmental Quality (Department) publishes the Virginia Toxics Release Inventory (TRI) Report, in accordance with Virginia Code § 10.1-1186.1. The Virginia TRI Report contains information on the release or other management of listed chemicals and chemical categories, as reported by Virginia industries in specified industrial sectors and by federal facilities located within the Commonwealth. The facilities' reports are required under federal law, known as the Emergency Planning and Community Right-to-Know Act (EPCRA), or SARA Title III. The Virginia TRI Report is a multi-media report, covering air, water, and waste management activities, and it addresses a variety of handling practices, including releases, recycling, energy recovery, and on-site and off-site treatment and disposal.

This year's Virginia TRI report covers calendar year 2004, the most recent year for which data is available, and includes all reports and revisions received by the Department on or before December 15, 2005. To improve the accuracy of reported data Virginia accommodated facilities and allowed additional changes to be submitted after the submission deadline of December 15, 2005. For calendar year 2004, 477 Virginia facilities filed 1779 individual reports on the release, transfer, or management of TRI chemicals or chemical categories. This was a (<4.79%) decrease from the 501 facilities and 1919 reports filed for calendar year 2003. In 2004, Virginia facilities reported the release, transfer, or management of 197 chemicals and chemical categories, out of the more than 650 chemicals and chemical categories that are subject to the TRI.

According to the reports, Virginia facilities reported the release, transfer, or on-site management of more than 374 million pounds of TRI chemicals during calendar year 2004 (a 1.2 % decrease from 2003). Of this total, 62.7 million pounds of TRI chemicals were released on-site at reporting Virginia facilities (a 3.2 % decrease from 2003), 64 million pounds of TRI chemicals were transferred off-site from reporting Virginia facilities for treatment, recycling, energy recovery, or disposal (a 1.4 % decrease from 2003), and an additional 247.4 million pounds of TRI chemicals were managed on-site by treatment, recycling, or energy recovery (a 0.60 % decrease from 2003).

The Virginia TRI Report addresses separately those TRI chemicals that the U.S. Environmental Protection Agency (EPA) has designated as persistent bioaccumulative toxins (PBTs). These chemicals remain in the environment for long periods of time, are not readily destroyed, and build up or accumulate in body tissue. According to the 2004 PBT reports:

307,734 pounds of PBT TRI chemicals were released on-site at reporting Virginia facilities;

1.78 million pounds of PBT TRI chemicals were transferred off-site from reporting Virginia facilities for treatment, recycling, energy recovery, or disposal; and

An additional 24,134 pounds of PBT TRI chemicals were managed on-site by treatment, recycling, or energy recovery.

Dioxins and dioxin-like compounds account for 31.95 grams (approximately 0.07 pounds) of the PBT chemicals released, transferred, or managed by Virginia facilities during calendar year 2004.

As required by statute, the Virginia TRI Report also addresses industrial sectors (identified by standard industrial code), facilities, and facility location (jurisdiction). For calendar year 2004, three reporting industrial sectors account for 66% of the total on-site releases to the environment. These were: electric, gas, and sanitary services; paper and allied products; and chemicals and allied products. The text of the report details further information about the industrial sectors, facilities, and jurisdictions with the largest reported on-site release, on-site management and other management of TRI chemicals.

The Virginia TRI Report provides the public with information concerning specified toxic chemicals and chemical compounds that are manufactured, processed, or otherwise used at categories of Virginia facilities. Responsible use of this information can help both the public and industry identify potential concerns and develop effective strategies for reducing toxic chemical usage and release. However, the TRI data does not represent a measure of the public's exposure to chemicals, nor does it assess risk. Many of the releases are regulated and permitted under other state and federal programs that are designed to protect human health and the environment. Because of differences in reporting schedules and receipt of reports, the information in the Virginia TRI Report will not precisely match the information in the national Toxics Release Inventory - Public Data Release, as published by EPA.

It is the policy of the Virginia Department of Environmental Quality to protect the environment of Virginia in order to promote the health and well-being of the Commonwealth's citizens. To this end, the Department implements numerous programs, as described on the Department's website at <http://www.deq.virginia.gov/programs/homepage.html>. The Department is committed to pollution prevention and elimination or reduction of waste at the source of generation. All parts of the agency and other sectors of government, all Virginia businesses and industry, and all Virginia's citizens have a role in managing and controlling the release of toxic chemicals in the Commonwealth.

Introduction

Part One - Virginia TRI Reporting

Statutory and Regulatory Basis

The Virginia Toxics Release Inventory (TRI) Report is published annually pursuant to Virginia Code § 10.1-1186.1 (see Appendix A). It contains information on the release, transfer, or management of listed chemicals and chemical categories, as reported by over 400 Virginia industries and federal facilities. The facilities are required to submit their reports pursuant to the federal Emergency Planning and Community Right to Know Act, as amended (EPCRA), also known as SARA Title III.¹ The Virginia Code directs the Virginia Department of Environmental Quality (the Department) to publish the Virginia TRI Report in March of each year and to include information for the most recent calendar year for which data are available - in this case, calendar year 2004. The Virginia Code also directs that the report be organized by chemical, facility, facility location, and standard industrial classification (SIC) code. Federal regulations require facilities to submit their TRI reports both to the U.S. Environmental Protection Agency (EPA) and to the Commonwealth. The Virginia TRI Report is compiled directly from the reports received from Virginia facilities.

A Glossary of Terms used in this report is included as Appendix B.

Current Year (2004) Virginia Facility Reports

Under the federal requirements, facilities are required to submit their reports for a calendar year by the following July 1 - for example, facilities were required to file their reports on their calendar year 2004 activities on or before July 1, 2005. Therefore, data for calendar year 2004 are the most recent available for this March 2006 report. Generally, Virginia TRI Report includes all reports and revisions received by the Department on or before December 15, 2005. To improve the accuracy of reported data Virginia accommodated facilities and allowed additional changes to be submitted after the submission deadline of December 15, 2005. For reporting year 2004, 477 Virginia facilities filed 1779 individual reports on the release or other management of TRI chemicals or chemical categories. This was a slight (<4.79 %) decrease from the 501 facilities and 1919 reports that were filed for reporting year 2003. Data for all reporting years are available to the public from the DEQ's SARA Title III office. This report and its attachments are also available to the public over the Internet (<http://www.deq.virginia.gov/sara3/313.html>) and in written form.

In 2004, Virginia facilities reported the release, transfer, or management of 197 of the more than 650 chemicals and chemical categories that are subject to the TRI.

Improvements to the 2004 Virginia TRI Report

Continuing the policy changes begun with the 2002 report, this year's TRI report contains additional information on the release, transfer, and management of TRI chemicals, including separate rankings by

¹ 42 U.S.C. § 11023, or SARA § 313.
*Virginia TRI Report – Summary of Data
from 2004 Facility Reports (issued March 2006)*

industry sector and jurisdiction. Assessing risk is beyond the statutory approval and is subject to site-specific interpretations and calculations. A request to make the TRI data accessible through a geographic information system (GIS) will be considered for future reports, but could not be accommodated this year. Readers are encouraged to utilize the resources listed in this report, its appendices, and other data to analyze the overall use, release, management, and health hazard of TRI chemicals.

Virginia is one of four states participating in the pilot program for online data collection of TRI reports. For 2004, 60% of TRI forms were submitted by facilities using the online central data exchange tool that is shared between EPA and the state.

Part Two - National Toxics Release Inventory Reporting Program

The National Toxics Release Inventory

The Virginia TRI Report is compiled directly from reports that Virginia facilities submit under federal law and regulations.² Using those same authorities, EPA compiles and maintains nation-wide information in its *Toxics Release Inventory - Public Data Release*, which is available to the public over the Internet (<http://www.epa.gov/tri/>) and in written form. The national Toxics Release Inventory was established to provide information to the public about the presence and release of toxic and hazardous chemicals in their communities. From inception, the national TRI program and Virginia's program have been expanding and evolving to meet the needs of an informed public. A list of supplementary resources on the program can be found in Appendix C, and more detailed information about the historical changes to the TRI program can be found in Chapter Four and in Appendix D.

Facilities That Must Report

Under the national TRI program, a facility must submit a TRI report (or reports) to EPA and the state if:

- 1) **It has ten or more full-time employees** (a combined total for all employees of 20,000 hours or more for the year);
- 2) **The facility's primary business is within one of 29 specified Standard Industrial Classification (SIC) codes.** The industry sectors include metal mining, coal mining, paper and allied products, chemicals and allied products, petroleum terminals and bulk stations, and others. The complete list of covered industry groups is in Appendix E; and
- 3) **The facility manufactured, processed, or otherwise used a reportable toxic chemical in quantities greater than the established threshold during the course of a calendar year.** The annual thresholds for non-PBT chemicals are 25,000 pounds for manufacturing, 25,000 pounds for processing, and 10,000 pounds for "otherwise use" of a TRI chemical. For PBT chemicals, the thresholds are lower. For example, dioxin and dioxin-like compounds have a threshold of 0.1 gram,

² The national TRI was established under Title III, Section 313, of the Federal Superfund Amendments and Reauthorization Act (SARA), which is also known as the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA), 42 U.S.C § 11023. The related federal regulations are found at 40 CFR Part 372.

and lead and lead compounds have a threshold of 100 pounds. For PBT chemicals, these lower reporting thresholds apply whether the chemical is manufactured, processed, or otherwise used. The definitions of "manufactured," "processed," and "otherwise used" can be found in the Glossary of Terms (Appendix B).

Federal facilities are also required to comply with EPCRA and the Pollution Prevention Act (PPA) of 1990, in accordance with Executive Order 13148. That Executive Order requires all federal facilities that manufacture, process, or otherwise use any listed EPCRA Section 313 chemical above the reporting threshold to submit a TRI report. The first federal facility reports were submitted on or before July 1, 1995 for calendar year 1994.

Chemicals and Chemical Categories

For a chemical or chemical category to remain on or be added to the TRI list, it must be known to cause or to reasonably be anticipated to cause one of the following:

- adverse acute health effects at significant concentration levels beyond facility boundaries as a result of continuous or frequently occurring releases;
- cancer in humans; or
- a significant adverse effect on the environment because of its toxicity and persistence in the environment.

As new chemicals of concern are identified, they are added to the TRI list. Conversely, if TRI chemicals are found not to meet the toxicity requirements, they can be deleted. Currently, the reportable TRI chemical list contains over 650 chemicals and chemical categories. A complete list of TRI chemicals and chemical categories for calendar year 2004 reports can be found in the EPA publication "The Emergency Planning and Community Right-to-Know Act - Section 313 Release and other Waste Management Reporting Requirements" (EPA260/K-01-001, February, 2001). The publication can be found online at: http://www.epa.gov/tri/guide_docs/2001/brochure2000.pdf. As noted, for 2004, Virginia facilities reported the release, transfer, or management of 197 of the more than 650 chemicals and chemical categories that are subject to the TRI.

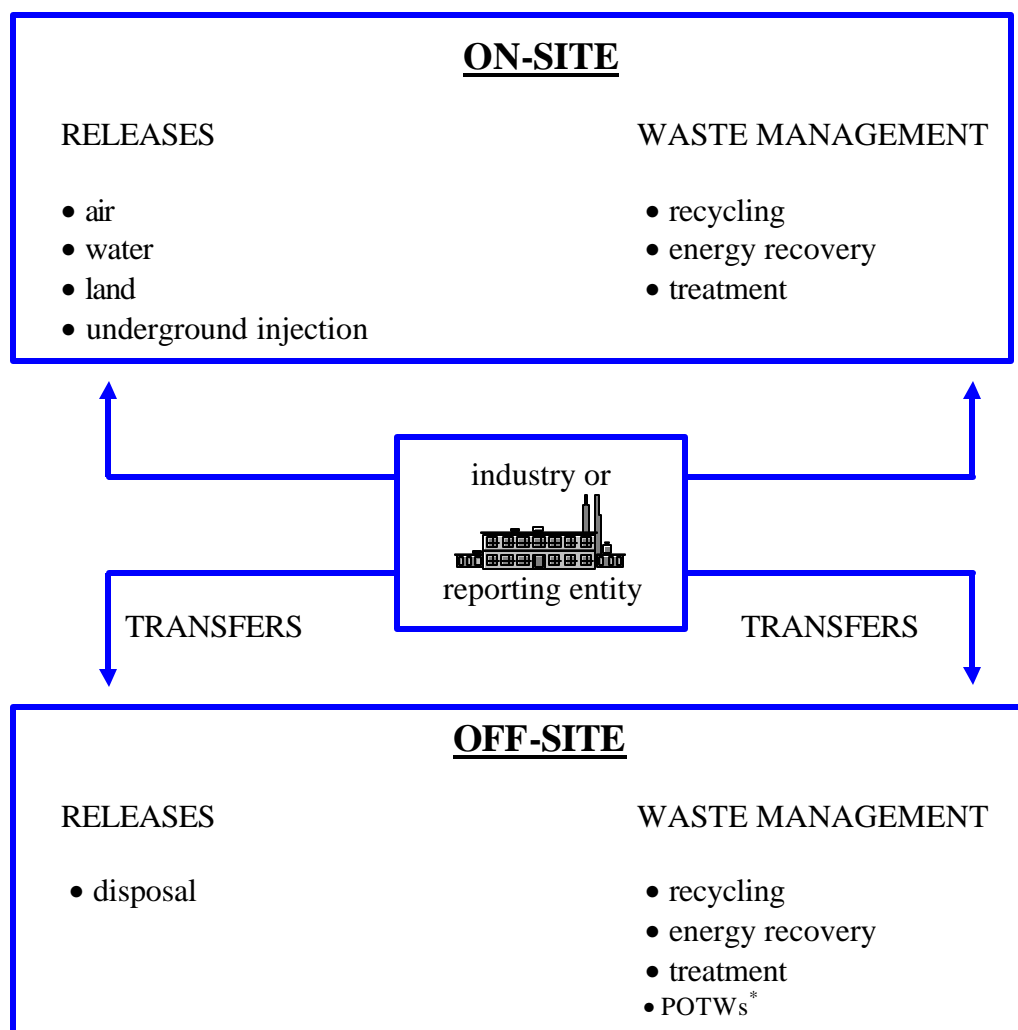
Reporting Forms and Activities That Must Be Reported

Each year, reporting facilities submit one reporting form for each TRI chemical or chemical category that is manufactured, processed, or otherwise used in amounts equal to or greater than the threshold values. For each TRI chemical or chemical category, facilities must submit either a Form A (simplified form) or a Form R (long form). Examples of both forms are in Appendix F. Form A has restrictions governing its use. A facility can use Form A only if the total annual reportable amounts for an individual chemical or category do not exceed 500 pounds, and if the facility's total manufactured, processed, and/or otherwise used amounts do not exceed one million pounds. PBTs cannot be reported on Form A.

Data used to prepare quantitative information in the Virginia TRI Report come principally from Part II of the Form R reports, and specifically from Sections 5, 6, 7, and 8 of Part II, Form R. These sections are referred to throughout the Virginia TRI Report and are described below:

- **Section 5: Quantity of toxic chemical entering/releasing to each environmental medium on-site.** Release reporting is broken down into categories: releases to the air (from stack and fugitive emissions), releases to water (onsite and to POTW offsite), and releases to land (underground injection, disposal to land, RCRA Subtitle C landfill, other landfills, land treatment/application farming, surface impoundment, or other disposal).
- **Section 6: Transfers of the toxic chemical in wastes to off-site locations.** Section 6 contains two main subsections: transfers to publicly owned treatment works (POTWs); and transfers to all other off-site locations (in-state or out-of state). Facilities are required to provide the name and location of off-site locations, the quantity transferred, and the method of management (treated, disposed, recycled, or burned for energy recovery).
- **Section 7: On-site waste treatment methods and efficiency (including energy recovery processes and recycling processes).** Facilities are asked to provide mostly qualitative information on the on-site treatment processes, the estimated range of influent concentration, and the efficiency of the operation.
- **Section 8: Source reduction and recycling activities.** Section 8 was added to the Form R reporting as a result of the federal Pollution Prevention Act in 1990, to track production-related activities. Section 8 extracts and re-aggregates data reported in Sections 5 through 7 into environmental releases (production-related on-site and off-site releases), off-site transfers/management, and on-site management. Where Section 7 contains qualitative information about on-site management practices, a subsection of Section 8 asks for related quantitative data. Section 8 and its subsections also request previous-year reporting and future year estimates for production-related releases, transfers for off-site management, and on-site management. Other subsections of Section 8 ask for episodic/catastrophic releases (non-production related), qualitative information on source reduction activities, and a production ratio or activity index to better engage the facility's efforts in source reduction.

The flow chart (Figure 1) shown below illustrates the information collected on Form R for TRI chemicals:

Figure 1 - Schematic Diagram of the TRI Data Collection Coverage

Part Three - Uses and Limitations of TRI Data

The Virginia TRI Report provides the public with information concerning designated toxic chemicals and chemical categories manufactured, processed, or otherwise used at facilities, including the amounts released to the environment and managed as wastes. Responsible use of this information can enable the public to identify potential concerns, and to work with industry and government to reduce toxic chemical releases and the risks associated with them.

Industry can use the data to obtain an overview of use and release of toxic chemicals, to identify and reduce costs associated with toxic waste, to identify promising areas for pollution prevention, to establish reduction targets, and to measure and document progress toward reduction goals.

* Publicly Owned Treatment Works
Virginia TRI Report – Summary of Data
from 2004 Facility Reports (issued March 2006)

The public availability of the data has assisted many facilities in working with their communities to develop effective strategies for reducing environmental and human health risks that may result from toxic chemical releases. Since the TRI Program's inception in 1988, there has been a historic downward trend in the amount of TRI chemicals released to the environment and managed as wastes, although the data for calendar year 2004 show a (1.4 %) decrease in the amounts released on-site, transferred off-site, and managed on-site over 2003 (see Chapter 4).

Nevertheless, there are limitations on the use of TRI data:

1. The TRI report contains reported information on the quantities of chemicals released and managed, not the public's exposure to or risk from the chemicals. Risk to human health by a chemical release depends on the toxicity of the chemical, how it disperses, reacts, or persists in the environment, and the quantity, concentration, and type of human exposure. Furthermore, chemicals reported for the TRI report are not weighted by their toxicity. For example, a pound of one substance may be more toxic or hazardous than 1000 pounds of another. Due to the limited nature of TRI data collected, readers are strongly discouraged from making any health or environmental risk/exposure assessments from the information presented. Many of the TRI chemical releases are permitted under other federal and state regulatory programs; therefore, data from these regulatory programs should provide additional information to better inform the citizens about their environment.
2. The TRI program captures only a portion of all toxic chemical releases in Virginia. It does not account for TRI chemicals from most non-manufacturing facilities, facilities with fewer than ten employees, facilities that do not meet the chemical quantity thresholds, other non-industrial sources, and transportation-related emissions.
3. The majority of facilities report TRI data based on estimates, since the TRI program does not require that they monitor releases, only that they use best available data. Using different methods to estimate data can result in significant variability from one facility to another, as well as from one year to the next.
4. Patterns of releases and other waste management activities can change significantly from one year to the next. Thus, the data in this report for a specific facility may be different from those reported for 2003.
5. Direct comparison between figures in this report and figures in past Virginia Toxics Release Inventory (TRI) Summary Reports is discouraged because of changes in reporting requirements and the authorized incorporation of revisions to previous years' data. Several historical comparisons, with appropriate standardization of data, have been made in Chapter 4 and Appendix G of this report.
6. EPA is required by law to compile an annual *Toxics Release Inventory - Public Data Release* on the national level. It is known and anticipated that the data published in the Virginia TRI Report will not completely correspond to the data published by the EPA. Contributing factors include: differing dates on which data are extracted for processing, revised facility reports, and facilities that mistakenly report to the Commonwealth or EPA but not both. The Department and EPA continue to work together to rectify such differences.

Chapter One - 2004 Virginia TRI Data Review

Chapter 1 describes the 2004 reporting year data in its entirety, based on the type of activity and the chemicals and chemical categories reported. The chapter is divided into four parts. Part One presents an overview and summary of 2004 data collected. Part Two discusses on-site releases of TRI chemicals to the environment, whether to air, water, or land. These data are derived from Section 5 of the Form R reports, as described in the Introduction. Part Three of the chapter discusses the off-site transfers of TRI chemicals, whether to publicly owned treatment works (POTWs) or to other off-site locations. These data are derived from Section 6 of the Form R reports. Part Four of the chapter discusses on-site and off-site management activities. These data are derived from Section 8 of the Form R reports. While this chapter includes all TRI chemicals, Chapter 2 addresses persistent bioaccumulative toxic (PBT) chemicals in more detail.

As described in the Introduction, Section 8 of the federal Form R asks facilities to extract and re-aggregate certain data from Sections 5 and 6. To avoid double-counting these chemicals in the Overview and Summary, only data that are independent of Sections 5 and 6 are presented when discussing "On-Site Management" in Part One of this chapter. When discussing Section 8 data as a whole, however, in Part Four of this chapter, all Section 8 data are used, including data extracted and re-aggregated from Sections 5 and 6, so that the balance between various on-site and off-site management activities can be shown.

Appendices H and I contain facility-specific information, arranged by jurisdiction, for TRI chemicals (excluding PBTs) and for PBT chemicals, respectively.

Part One - 2004 Overview and Summary

For calendar year 2004, Virginia facilities reported that they released, transferred, or managed over 374 million pounds of TRI chemicals (see Table 1).

Approximately 62.7 million pounds of TRI chemicals were reported to have been released on-site to the environment. Air releases represented approximately 48 million pounds, or 76 % of all the TRI chemicals released on-site in 2004. Releases to the water totaled approximately 9.1 million pounds, or 15 % of the total released on-site. Releases to the land totaled approximately 5.6 million pounds, or 9 % of the total released on-site. For 2004, the amount of TRI chemical releases to the environment represented approximately 16.76 % of the total for TRI chemicals by this measure.

Off-site transfers totaled approximately 64 million pounds of TRI chemicals. Off-site transfers to Publicly Owned Treatment Works (POTWs) totaled approximately 15.6 million pounds. Off-site transfers to other (non-POTW) facilities (for treatment, recycling, energy recovery and disposal) totaled approximately 48.3 million pounds. For 2004, the amount of TRI chemicals transferred off-site represented approximately 17.1 % of the total for TRI chemicals by this measure.

Facilities reported that approximately 247.4 million pounds of TRI chemicals were managed on-site by treatment, recycling, or energy recovery. For 2004, this amount of chemicals managed onsite represents approximately 66.1% of the total TRI Chemicals.

Table 1. Summary of Data by Type of Release, Transfer, and On-Site Management for TRI Chemicals (in pounds per year)

ON-SITE RELEASES BY MEDIA (Section 5 of Form R)	
Total Air	47,972,931
Fugitive Air	5,067,800
Stack Air	42,905,131
Total Water	9,146,470
Total Land	5,612,934
Landfills	3,691,451
Land Treatment / Application	326,657
Surface Impoundment	1,402,337
Other Disposal	192,177
Total On-Site Releases to Media	62,732,335

OFF-SITE TRANSFERS BY TYPE (Section 6 of Form R)	
Publicly Owned Treatment Works (POTWs) (includes metals and metal compounds)	15,616,396
Total Other Off-Site Transfers	48,389,359
Off-Site Transfers for Recycling	22,706,888
Off-Site Transfers for Energy Recovery	14,159,015
Off-Site Transfers for Other Treatment	1,809,680
Off-Site Transfers for Disposal	9,713,777
Total Off-Site Transfers	64,005,755

ON-SITE MANAGEMENT (From Section 8 of Form R) *	
Treated On-Site	137,665,290
Recycled On-Site	93,879,346
Energy Recovery On-Site	15,832,947
Total On-Site Management	247,377,583

Total TRI Chemicals Released On-site, Transferred Off-site, or Managed On-site by Reporting Facilities	374,115,673
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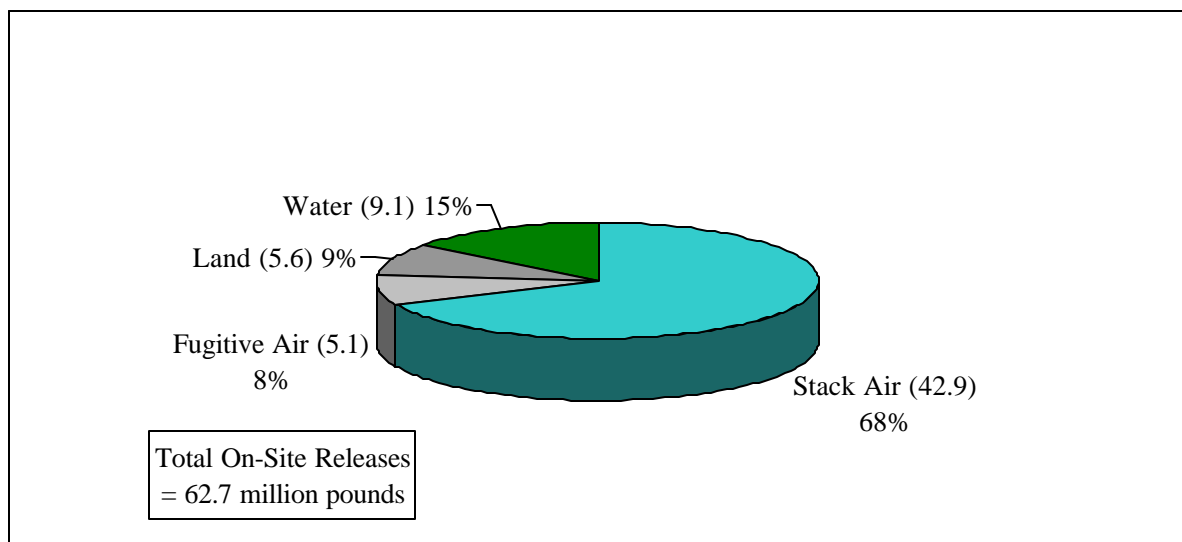
* The data for the on-site management of TRI chemicals is a summary of data collected from Part II, Sections 8.2, 8.4, and 8.6 of the Form R. These sections, in turn, are quantitative data not reported anywhere else in the Form R and reflect on the descriptive data reported in Part II, Section 7 (on-site management practices - treatment, energy recovery, and recycling) of the Form R. Data extracted and re-aggregated to Section 8 from Sections 5 and 6 of Form R have not been included here, to avoid duplicate counting.

Part Two - On-Site Releases to the Environment

Part Two of this Chapter discusses the on-site releases of TRI chemicals to the environment by facilities, as reported in Section 5 of the TRI Form R. The quantities reported in Section 5 include production-related releases, any catastrophic releases or one-time events not associated with routine production processes.

A release refers to an on-site discharge of TRI chemicals to the air, water, land, and/or disposal in underground injection wells. Any reductions in waste achieved by on-site treatment methods are taken into account when facilities determine their release data. Approximately 62.7 million pounds of TRI chemicals were reported as released into the environment by reporting facilities for reporting year 2004.

Figure 2. On-Site Releases of TRI Chemicals to All Media for Reporting Year 2004 (from Section 5 of Form R. The number inside the parentheses is the quantity of releases in each category in millions of pounds, and the percent figure is the percent of total on-site releases.) There were no underground injection releases reported in 2004.

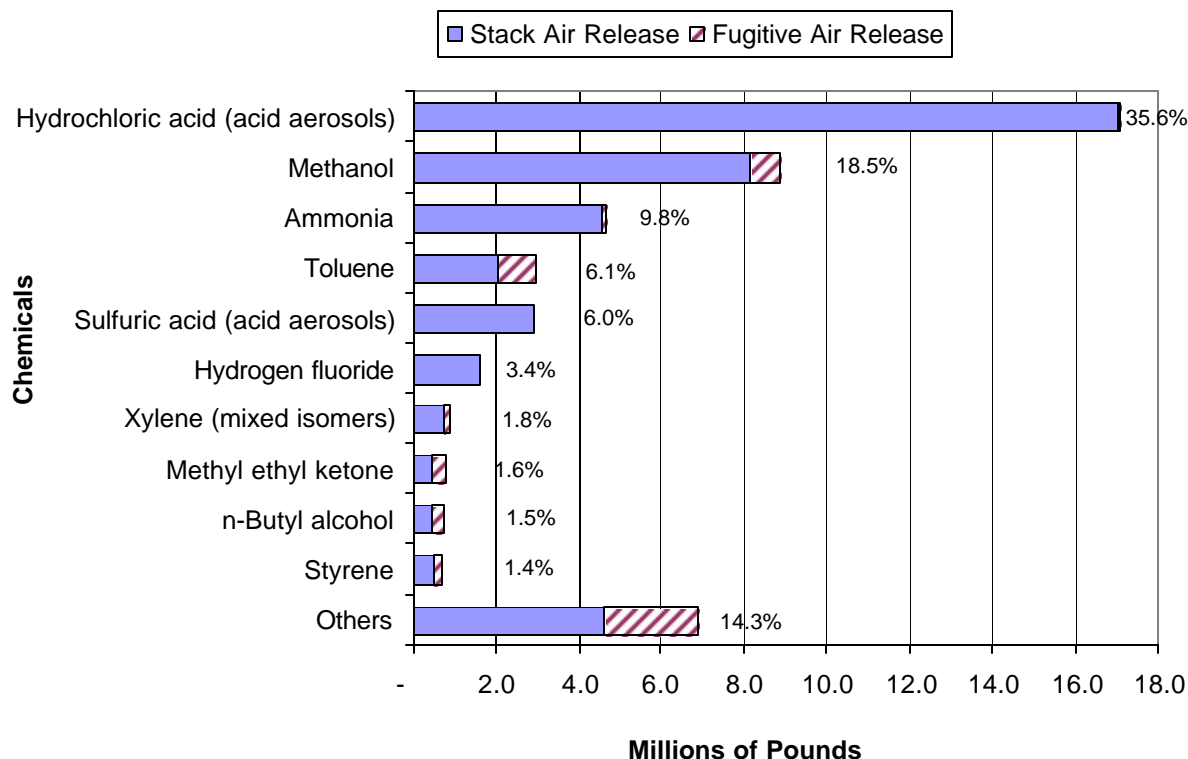
**On-Site Releases to the Air**

On-site air releases are classified as either “fugitive” (non-point source) or “stack” (point source) air emissions. Examples of fugitive air emissions are equipment leaks from valves, pump seals, flanges, compressors, sampling connections, open-ended lines, and evaporative losses from surface impoundments and spills. Stack air emissions are releases to the air that are conveyed through stacks, ducts, pipes, vents, or other confined air streams. Most, if not all, facilities reporting to TRI have permitted stack air emissions.

Based on the amount of fugitive and stack emissions reported, total air release of all TRI chemicals was 48 million pounds, which accounted for 76% of the total on-site releases to all media (air, water, and land). The top ten TRI chemicals released to the air made up approximately 86% of the total reported TRI air emissions in 2004 (See Figure 3). The top ten TRI chemicals released to the air in Virginia were: hydrochloric acid, methanol, ammonia, toluene, sulfuric acid, hydrogen fluoride, xylene (mixed isomers), methyl ethyl ketone, n-butyl alcohol, and styrene. Acid aerosols such as hydrochloric acid, sulfuric acid, and hydrogen fluoride were mainly generated during the combustion of coal or oil. Electric power generating facilities, in particular, contributed to the emissions of acid aerosols.

Methanol, ammonia, and toluene continued to be the significant air pollutants generated from the manufacturing sector.

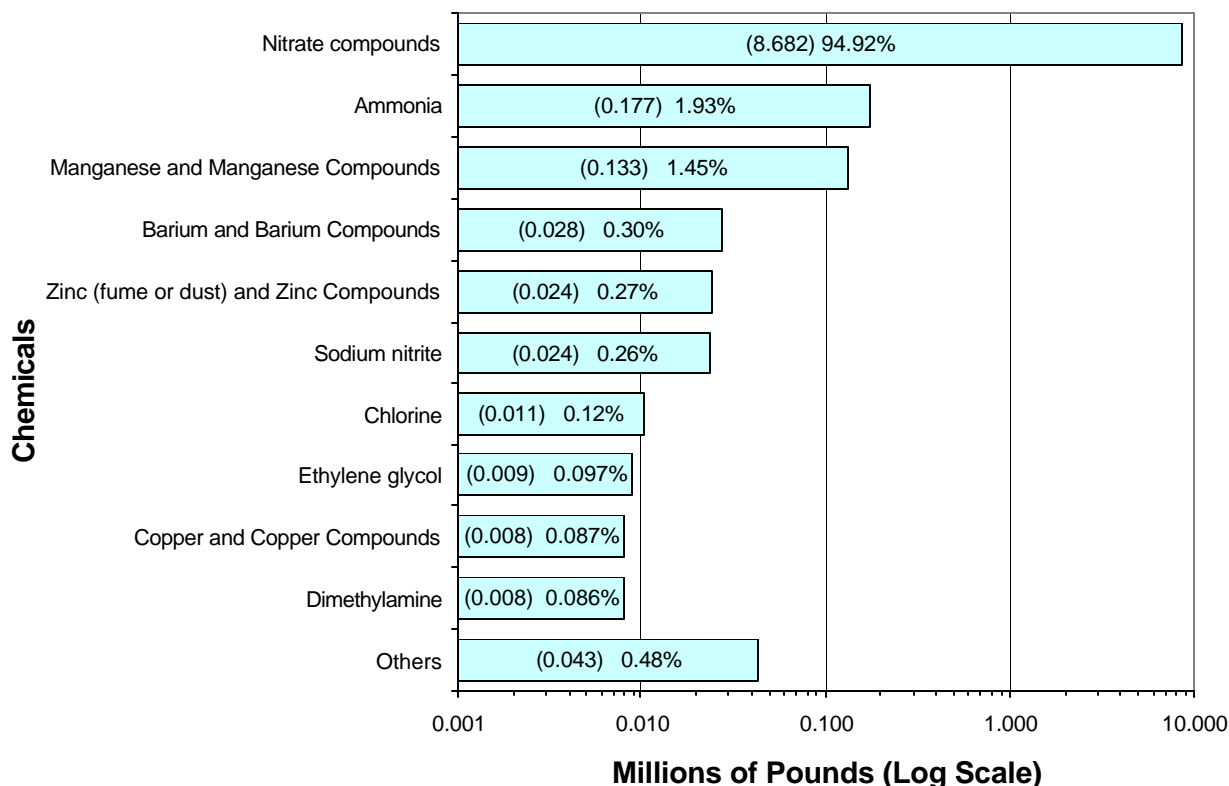
Figure 3. Top Ten TRI Chemicals Released to the Air On-Site in 2004 (from Section 5 of Form R. The number next to each bar is the % of total air releases for all 2004 chemicals reported.)



On-Site Releases to Water

On-site releases to water include discharges to surface waters, such as rivers, lakes, ponds, and streams. Reported on-site releases of TRI chemicals to water in 2004 totaled 9.1 million pounds and accounted for 15% of all on-site releases to the air, water, and land in 2004. Ten chemicals and chemical categories accounted for more than 99% of the on-site TRI chemical releases to the water. The top ten TRI chemicals released to water were: nitrate compounds (94.9 % of total releases to water), ammonia, manganese and manganese compounds, barium and barium compounds, zinc and zinc compounds, sodium nitrite, chlorine, ethylene glycol, copper and copper compounds, and dimethylamine. Nitrate compounds are a common byproduct of industrial wastewater treatment processes and have consistently been reported as the major chemical released to the surface water. Nitrates can pose a nutrient problem to water bodies.

Figure 4. Top Ten TRI Chemicals Released to Water On-Site in 2004 (from Section 5 of Form R.) The information presented here is in logarithmic, base 10 scale, which compresses the bar chart to show up to 840-fold magnitudes of difference between **nitrate compounds** and **dimethylamine**. Please note the scale mark of 1.000 means 1 million pounds, the scale mark of 0.100 means 0.1 million pounds, etc. The number in the parentheses represents the quantity in millions of pounds followed by percent of total reported releases to water.

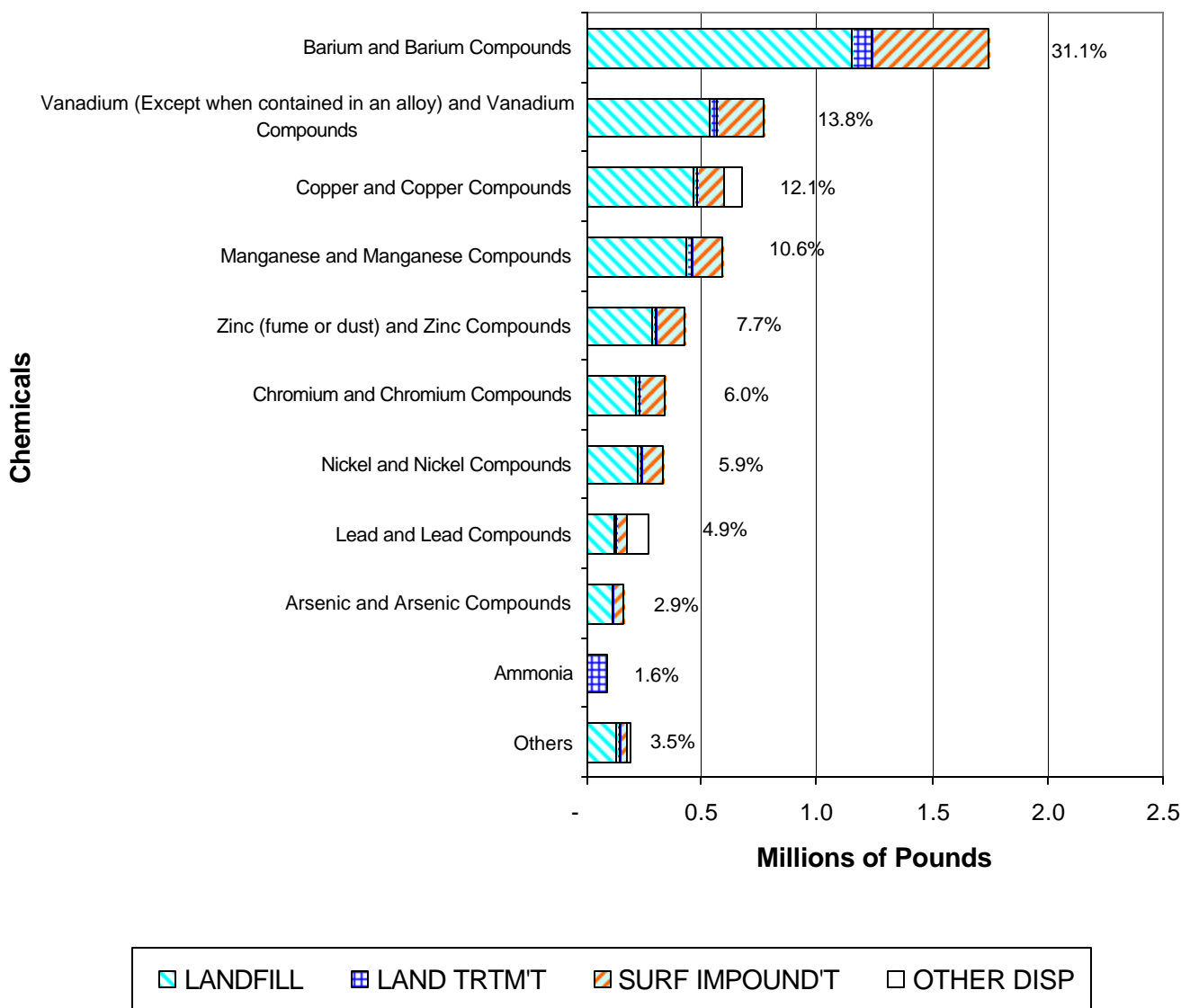


On-Site Releases to the Land

On-site releases to the land refer to landfilling, surface impoundment, land treatment/application farming, or any other release of a TRI chemical to land within the boundaries of a facility. Virginia does not permit underground injection as a method of hazardous waste disposal, and no underground injection or RCRA Subtitle C-permitted land disposal of TRI chemicals was reported in 2004.

The total amount of TRI chemicals released to the land in Virginia during 2004 was 5.6 million pounds. That accounted for 9% of all reported on-site TRI releases (releases to the air, water, and land). The top ten TRI chemicals constituted approximately 96.6% of all the TRI chemicals released to the land. They were: barium and barium compounds, vanadium and vanadium compounds, copper and copper compounds, manganese and manganese compounds, zinc and zinc compounds, chromium and chromium compounds, nickel and nickel compounds, lead and lead compounds, arsenic and arsenic compounds, and ammonia (Figure 5). Metals and metal compounds such as barium are found naturally in coal combusted for energy generation and in the ashes remaining after combustion of the coal. Ammonia is the only chemical in the top ten list that is not a metal.

Figure 5. Top Ten TRI Chemicals Released On-Site to the Land in 2004 (from Section 5 of Form R. The number next to each bar is the % of total on-site land releases for all 2004 chemicals reported.)



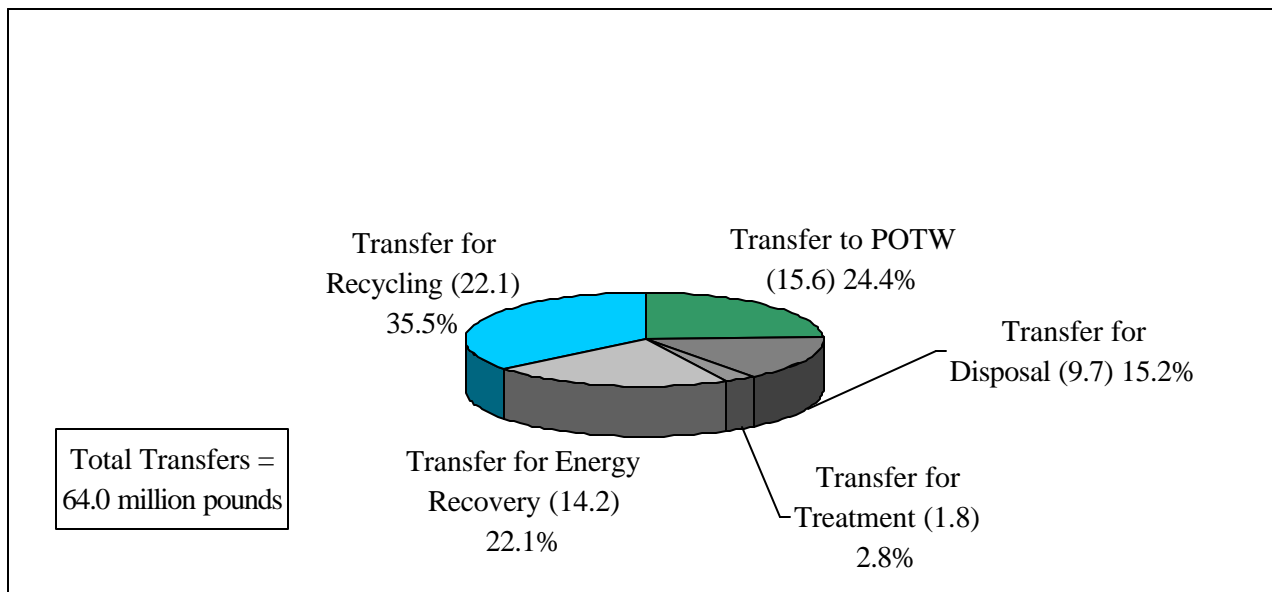
Part Three - Off-Site Transfers to the Environment

Transfers refer to TRI chemicals sent off-site. Transfers are reported as transfers to Publicly Owned Treatment Works (POTWs) or other off-site destinations, such as incinerators, landfills, or other facilities for treatment, recycling, energy recovery, or disposal that are not part of the reporting facility.

In this section, data are collected from Section 6 of Form R. For 2004, 64 million pounds of TRI chemicals were reported as sent off-site for further management or disposal.

Figure 6. All Off-Site Transfers of TRI Chemicals for Reporting Year 2004

(from Section 6 of Form R. The number inside the parentheses is the quantity of transfers in each category in millions of pounds and the percent figure is the percent of total transfers.)

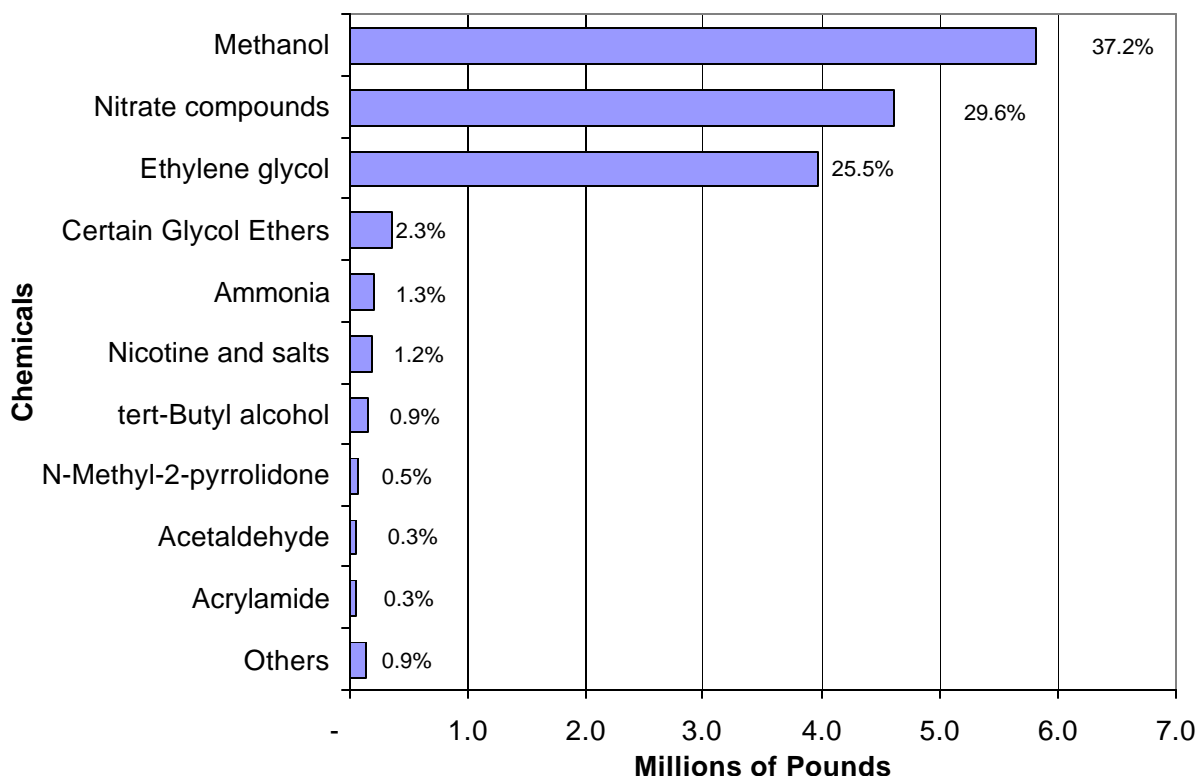


Transfers to Publicly Owned Treatment Works (POTWs)

A POTW is a wastewater treatment facility that is owned by a state or local government. Wastewater from facilities reporting under TRI is transferred through pipes or sewers to the POTW. The TRI information summarized below reports transfers of a chemical to a POTW; however, this is not necessarily the same as the release of a chemical to the environment. TRI chemicals may be treated, destroyed, and/or removed from the environment in a POTW's physical, chemical, and biological treatment processes. Some TRI chemicals are almost completely destroyed by a POTW. However, not all chemicals can be treated or removed by a POTW. Some chemicals such as metals and metal compounds may be removed but not destroyed. These may ultimately be disposed of in a permitted landfill, disposed of in a permitted land application process, or released through a permitted discharge to receiving waters.

Ten TRI chemicals accounted for approximately 99% or 15.4 million pounds of the total 15.6 million pounds of TRI chemicals transferred to POTWs in reporting year 2004. Methanol has been the leading pollutant discharged to POTWs for treatment for this reporting period. The remaining top nine TRI chemicals transferred to POTWs in 2004 were: nitrate compounds, ethylene glycol, glycol ethers, ammonia, nicotine and salts, tert-butyl alcohol, n-methyl-2-pyrrolidone, acetaldehyde, and acrylamide.

Figure 7. Top Ten TRI Chemicals Transferred to Publicly Owned Treatment Works (POTWs) in 2004 (from Section 6.1 of the Form R. The number next to each bar is the % of total transfers to POTW)

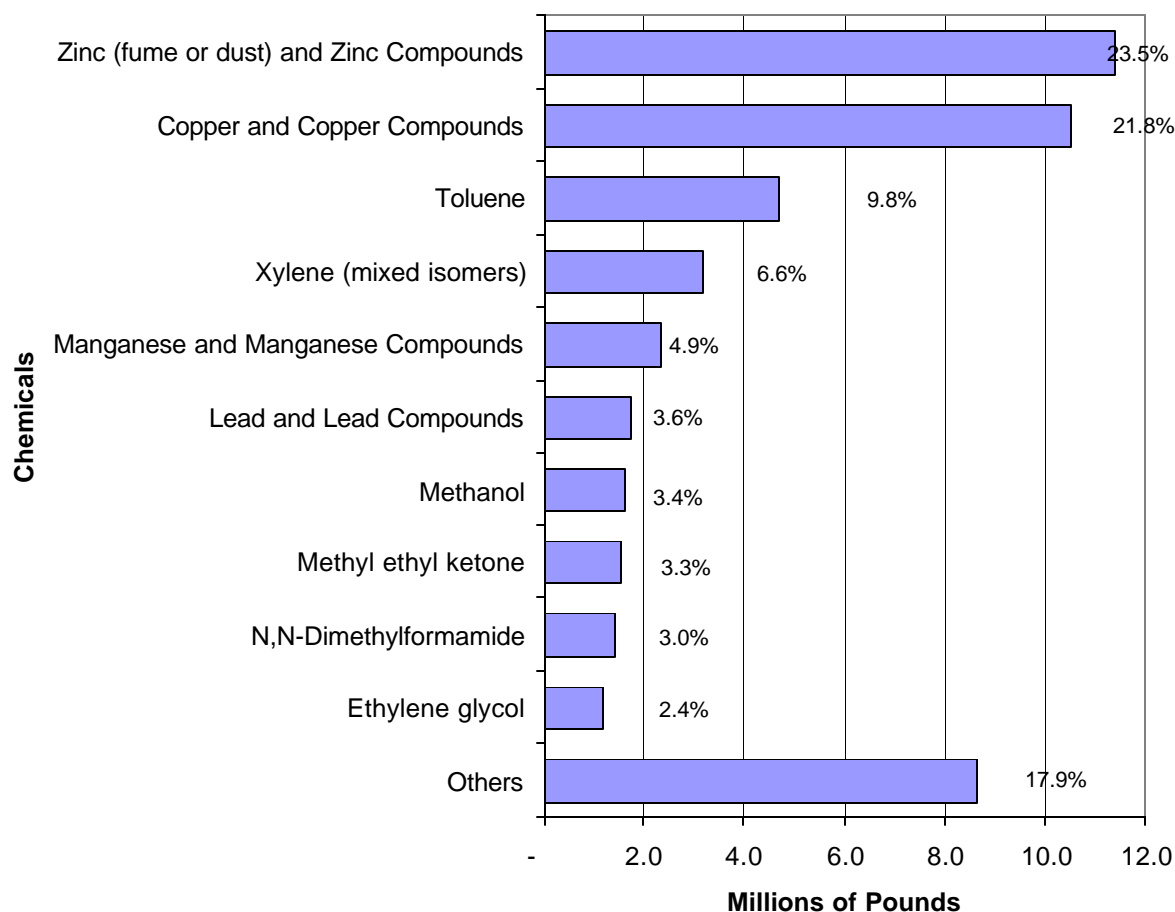


Transfers to Other Off-Site Locations

The Form R report also sets out the transfers of TRI chemicals to facilities other than POTWs. These other off-site locations include incinerators, landfills, and other treatment, energy recovery, recycling, and/or disposal facilities. Off-site transfers can be to facilities located inside or outside of the Commonwealth.

In 2004, the total amount of TRI chemicals transferred to other off-site locations was approximately 48.3 million pounds. Ten TRI chemicals represented approximately 82.3% of the total TRI chemicals transferred off-site to locations other than POTWs. The top ten TRI chemicals and chemical categories transferred off-site to locations other than POTWs in 2004 were: zinc and zinc compounds, copper and copper compounds, toluene, xylene (mixed isomers), manganese and manganese compounds, lead and lead compounds, methanol, methyl ethyl ketone, n,n-dimethylformamide, and ethylene glycol.

Figure 8. Top Ten TRI Chemicals Transferred to Off-Site Locations Other than POTWs in 2004
(from Section 6.2 of the Form R. The number next to each bar is the % of total transfers to other off-site locations)



Part Four - On-Site and Off-Site Management

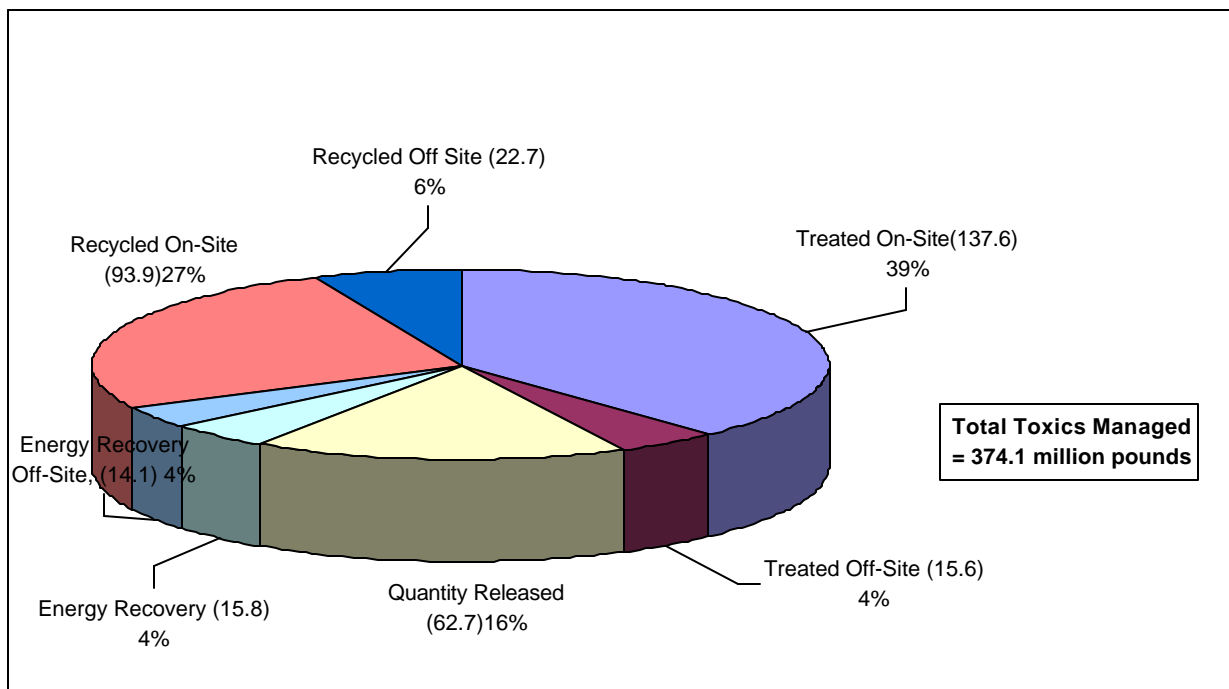
Under the Pollution Prevention Act of 1990, facilities subject to EPCRA Section 313 must report their source reduction and recycling activities. Consequently, EPA added Section 8 to the Form R to track production-related activities. Section 8 contains 11 subsections and requires facilities to extract and re-aggregate data reported in Sections 5 through 7 into releases (on- and off-site releases to the environment); off-site transfers/management; and on-site management categories. This part of Chapter One discusses all Section 8 data, so that the relative methods of toxic chemical management can be compared.

Some of the data and information reported in Sections 5, 6, and 7 are handled differently for Section 8 reporting. The differences are that the releases-to-the-environment data in Section 8 exclude catastrophic releases and one-time events not associated with the production process. Furthermore, metal and metal compounds reported as transfers for off-site management in Section 6 are aggregated with the on-site release data from Section 5 as releases to the environment. Metal and metal compounds cannot be destroyed through treatment; hence, their final disposal is considered a release to the environment. There are other differences in how quantities are reported, so that the total toxics managed, as reported in Section 8, does not precisely match the total in Table 1. Also, Section 8 is the only part of the Form R that contains quantitative data on on-site waste management activities other than releases. While Section 7 contains qualitative information about on-site management practices, a subsection of Section 8 asks for quantitative data related to information reported in Section 7.

Consistent with the pollution prevention goal, Section 8 and its subsections also report additional information that addresses resource reduction efforts. In general, facilities utilize several options to manage TRI chemicals. Treatment of waste, both on-site and off-site, involves a variety of methods, including biological treatment, neutralization, incineration, and physical separation. Another option is on-site or off-site recycling. This involves the toxic chemicals in wastes being recovered or reclaimed and being returned for further processing or being made available for use in commerce. Energy recovery involves the combustion of toxic chemicals in industrial furnaces or boilers that generate energy for on-site or off-site use. The least preferable and last management option is disposal, which is considered a release to the environment.

As reported in Section 8 of the 2004 facility reports, more than 374 million pounds of production-related TRI chemicals were released, treated, recycled, or recovered both on-site and off-site from Virginia facilities (Figure 9). Approximately 66% of the TRI chemicals were managed on-site and 10% were transferred off-site to be managed by various means. As reported in Section 8 data, 16% of the reported TRI chemicals were released into the environment on-site.

Figure 9. 2004 Management of TRI Chemicals (from Section 8 of Form R. The number inside the parentheses is the quantity of TRI chemicals handled by each management option in millions of pounds and the percent value is the percent of the option to the total TRI chemicals managed by all options.)



Comparison between Table 1 and Figure 9 is discouraged. Table 1 contains data extracted from Sections 5, 6, and a portion of Section 8 of the TRI reports while Figure 9 is a compilation of data reported only in Section 8. Differences in the reporting are explained above. Because of these differences, the totals for Table 1 and Figure 9 do not precisely match.

Chapter Two - 2004 TRI Data for PBT Chemicals

This chapter addresses persistent bioaccumulative toxic (PBT) chemicals. PBT chemicals are those that remain in the environment for long periods of time, are not readily destroyed, and build up or accumulate in body tissue. Because of these attributes, beginning with reporting year 2000, EPA added several PBT chemicals to the TRI reporting list, and it lowered the reporting thresholds for 18 PBT chemicals and chemical categories. Beginning with reporting year 2001, lead and lead compounds were added to the PBT list, and their thresholds lowered to 100 pounds per year. Previously, lead and lead compounds had been treated as non-PBT chemicals.

For reporting year 2004, the Department received 346 reports and revisions for PBT chemicals, out of a total of 1779 TRI reports and revisions (19.4%). Table 2 shows the reporting thresholds for the TRI PBTs. The table also shows that only eight of the 20 PBTs were reported as released, transferred, or managed by facilities in Virginia for reporting year 2004. Appendix I has facility-specific information for PBT chemicals. Appendix J has general health and environmental information about the eight PBTs reported for the 2004 Virginia TRI Report.

Table 2. TRI Reporting Year 2004 Persistent Bioaccumulative Toxic (PBT) Chemicals - Reporting Thresholds and Number of Reports Received

CAS Number	Chemical /Chemical Category Name	Reporting threshold	Reports received
309-00-2	Aldrin	100 lbs.	0
191-24-2	Benzo(g,h,i)perylene	10 lbs.	36
57-74-9	Chlordane	10 lbs.	0
N150	Dioxin and Dioxin-Like Compounds	0.1 gram	36
76-44-8	Heptachlor	10 lbs.	0
118-74-1	Hexachlorobenzene	10 lbs.	0
465-73-6	Isodrin	10 lbs.	0
7439-92-1	Lead	100 lbs.	85
N420	Lead Compounds	100 lbs.	96
7439-97-6	Mercury	10 lbs.	7
N458	Mercury Compounds	10 lbs.	35
72-43-5	Methoxychlor	100 lbs.	0
29082-74-4	Octochlorostyrene	10 lbs.	0
40487-42-1	Pendimethalin	100 lbs.	0
608-93-5	Pentachlorobenzene	10 lbs.	0
1336-36-3	Polychlorinated biphenyls (PCBs)	10 lbs.	1
N590	Polycyclic aromatic compounds (PACs)	100 lbs.	50
79-94-7	Tetrabromobisphenol A (TBBPA)	100 lbs.	0
8001-35-2	Toxaphene	10 lbs.	0
1582-09-8	Trifluralin	100 lbs.	0

Table 3 provides an overview and summary of 2004 PBT data. The data is organized as in Table 1, Chapter 1. In order to avoid duplicate counting, data extracted and re-aggregated in Section 8 from Sections 5 and 6 of Form R have not been included as "On-Site Management" in Table 3.

Table 3. Summary of Data by Type of Release, Transfer, and On-Site Management for PBT Chemicals (Dioxin and dioxin-like compounds are listed separately from the "Other PBT Chemicals" column because they were reported in grams, while the other PBT chemicals were reported in pounds. A conversion to pounds is shown in parentheses.)

ON-SITE RELEASES BY MEDIA (Section 5 of Form R)	Dioxin and dioxin-like compounds* (amounts for the year)	Other PBT chemicals (amounts for the year)
Total Air	27.1642 g (0.05976 lbs.)	29,650.73 lbs.
Fugitive Air	3.0095 g (0.00662 lbs.)	6969.45 lbs.
Stack Air	24.1547 g (0.05314 lbs.)	22,681.28 lbs.
Water	2.2775 g (0.00501 lbs.)	2,625.89 lbs.
Land	1.4870 g (0.00327 lbs.)	275,457.39 lbs.
Total On-Site Releases to Media	30.9287 g (0.06804 lbs.)	307,734.01 lbs.

OFF-SITE TRANSFERS BY TYPE (Section 6 of Form R)		
Publicly Owned Treatment Works (POTWs) (includes metals and metal compounds)	1.24 g (0.00273 lbs.)	676.62 lbs.
Total Other Off-Site Transfers	1.0225 g (0.00225 lbs.)	1,776,242.27 lbs.
Off-Site Transfers for Recycling	0 g (0 lbs.)	1,155,492.50 lbs.
Off-Site Transfers for Energy Recovery	0 g (0 lbs.)	1,296.22 lbs.
Off-Site Transfers for Other Treatment	0 g (0 lbs.)	15,605.29 lbs.
Off-Site Transfers for Disposal	1.0225 g (0.00225 lbs.)	603,848.26 lbs.
Total Off-Site Transfers	2.2625 g (0.00498 lbs.)	1,776,918.89 lbs.

ON-SITE MANAGEMENT (Section 8 of Form R)		
Treated On-Site	0 g (0.00 lbs.)	17.5 lbs.
Recycled On-Site	0 g (0 lbs.)	23,805.21 lbs.
Energy Recovery On-Site	0 g (0 lbs.)	311 lbs.
Total On-Site Management	0 g (0.00 lbs.)	24,133.71 lbs.
Total PBT Chemicals Released On-site, Transferred Off-site, and Managed On-site by Reporting Facilities	31.9512 g (0.0703 lbs.)	2,108,786.61 lbs.

* Facilities are allowed to report PBT chemicals up to 7 decimal places accuracy. For presentation purposes the summary amounts in this table have been rounded; however, the integrity of facility reported data has been maintained in the database. The specific data that was reported by each facility is located in Appendix I.

Comparing Table 3 (PBT information) to Table 1 (information on all TRI chemicals), the amount of reported PBTs released on-site (307,734 pounds) was 0.49 % of the total TRI chemicals released on-site to the environment. The reported PBTs managed on-site (24,116 pounds) were less than one one-hundredth of one percent (0.009%) of the total TRI chemicals managed on-site. A greater percentage of PBTs were transferred off-site for treatment, recycling, energy recovery, or disposal (2.8%, or 1.8 million pounds). In reporting year 2003, the on-site releases of PBT contributed to 0.60% of the total releases, 0.014% of on-site management, and 2.1% of off-site transfers.

Information on the amounts of each individual chemical/chemical category released on-site, transferred off-site, and managed on-site for the seven PBT chemicals reported by Virginia facilities is provided in Table 4.

Table 4. Reporting Year 2004 Amounts of TRI PBT Chemicals released on-site, transferred off-site, and managed on-site, by PBT (Dioxin and Dioxin-like compounds have been converted to pounds and included in the totals)

Chemical Name	Released On-Site (in pounds) (from Section 5)	Transferred Off-Site (in pounds) (from Section 6)	Managed On-Site (in pounds) (from Section 8)
Benzo(g,h,i)perylene	176.84	32.37	0.30
Dioxin and Dioxin-Like Compounds	0.07	0.00	0.00
Lead	32,202.85	939,279.21	14,989.81
Lead Compounds	265,525.55	815,720.29	9,109.00
Mercury	183.07	214.20	0.00
Mercury Compounds	3,163.30	778.16	0.00
Polychlorinated biphenyls (PCBs)	0.00	222.00	0.00
Polycyclic aromatic compounds (PACs)	6,482.41	19,995.03	34.60
Total for all 8 chemical/categories	307,734.08	1,776,241.26	24,133.71

Of the PBTs listed in Table 4, lead and lead compounds, polycyclic aromatic compounds (PACs), and mercury and mercury compounds contributed most to the on-site releases to the environment, off-site transfers, and on-site management of PBT chemicals. Lead and lead compounds contributed to the bulk (99.4%) of the PBT on-site releases. Referring back to Figures 5 and 8 in Chapter 1, lead and lead compounds ranked eighth in chemicals released on site to land in Virginia and sixth in chemicals transferred off-site other than to POTWs. Releases of lead and lead compounds and mercury and mercury compounds to the air (via stacks) or to the land (through fly ash disposal) can result from coal or oil combustion. PACs may form as a result of incomplete combustion of coal or oil or as a by-product of other industrial processes. PACs found in the waste stream can contain adequate BTUs for energy recovery from incinerated waste.

Previous tables and figures have shown the management and environmental releases of those PBT reported to Virginia in 2004. Table 5 data show the distribution of PBTs versus reported activities (manufacture, process, or otherwise use). These three threshold activities are defined in the Glossary of Terms (Appendix B). A facility may report more than one type of activity for a TRI chemical.

Table 5. Activities and Uses of PBT chemicals at facilities (from Section 3 of the Form R) for 2004

Chemical Name	Activities Reported						
	manufacturing only	processing only	otherwise use only	both manufacturing & processing	both manufacturing & otherwise	both processing & otherwise	manufacturing & processing & otherwise use
Benzo(g,h,i)perylene	23	14	24	5	16	3	3
Dioxin and Dioxin-Like Compounds	34	0	2	5	0	0	0
Lead	13	43	26	7	7	5	4
Lead Compounds	51	37	18	3	2	3	3
Mercury	2	3	2	0	0	0	0
Mercury Compounds	30	13	17	8	13	9	6
Polychlorinated Biphenyls (PCBs)	0	0	1	0	0	0	0
Polycyclic aromatic compounds (PACs)	26	5	31	5	16	2	2
Total for all 8 chemical/categories	179	115	121	33	54	22	18

Table 5 shows that “manufacturing only” was the most frequently reported activity (179) involving PBT chemicals. Manufacturing was followed by “otherwise use” (121), and “processing only” (115). Main industrial sectors that reported processing of lead or lead compounds were the furniture and fixture industries; stone, clay, glass, and concrete products industries; primary metal and fabricated metal products industries; electronic or electrical equipment manufacturers; petroleum bulk plant operators; and manufacturer of transportation equipment. Dioxin and dioxin-like compounds are normally a product of incomplete combustion of waste stream containing chlorinated products. Lead or lead compounds can be co-manufactured under chemical manufacturing processes or as a by-product of fuel (coal or fuel oil) combustion. Industries such as primary metal; stone, clay, and glass products; transportation equipment manufacturers; electric power generation facilities; solvent recovery facilities; and paper and allied products industries were key reporters of lead compounds and mercury compounds in all three (manufacturing, processing, and otherwise used) activities.

CHAPTER THREE - INDUSTRIAL SECTORS, FACILITIES, AND JURISDICTIONS

In this chapter, the 2004 Virginia TRI Report presents information on industrial sectors, as identified by the primary Standard Industrial Classification Code (Part One), facilities (Part Two), and facility locations (Part Three). The Code of Virginia requires that the Virginia TRI Report address these considerations. The chapter identifies the top ten Virginia industrial sectors, facilities, and facility locations (jurisdictions) based on the reported on-site releases and the total on-site management of TRI chemicals.

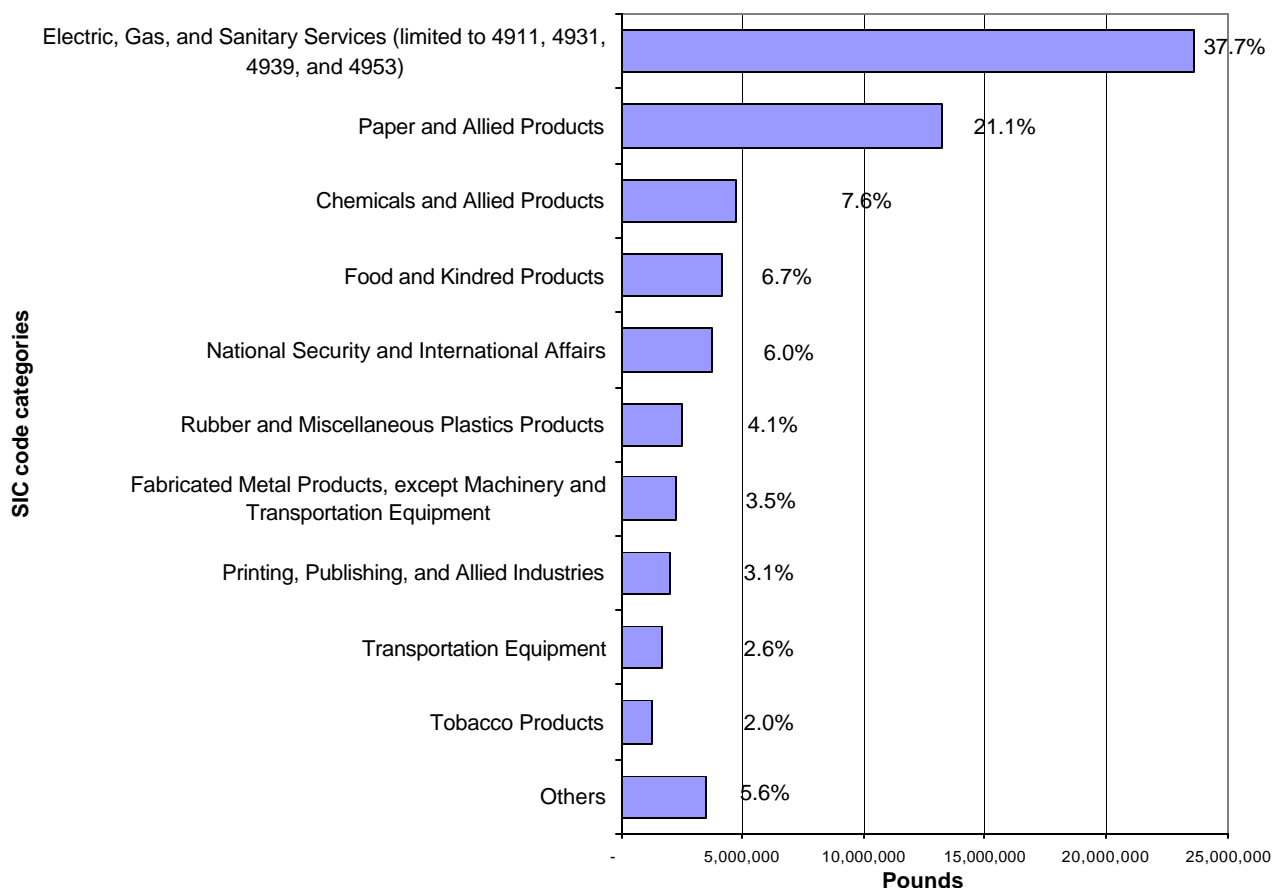
As with Table 1 (Chapter 1) and Table 3 (Chapter 2), in order to avoid double counting, the data in this chapter for on-site management do not include the data extracted and re-aggregated from Sections 5 and 6 of Form R. Complete rankings of industrial sectors, facilities, and jurisdictions are included in Appendices K, L, and M.

Part One - Industrial Sectors

Industrial Sectors Reporting On-Site Releases of TRI Chemicals

Twenty-nine (29) industrial sectors, as well as federal facilities, are subject to TRI reporting requirements (see Appendix E). The three industrial sectors reporting the most on-site releases of TRI chemicals for 2004, based on the primary Standard Industrial Classification (SIC) Code, were: electric, gas, and sanitary services; paper and allied products; and chemicals and allied products. These three sectors contributed to 66% of the total on-site releases to the environment. The remaining top ten reporting industrial sectors for 2004 were: food and kindred products; national security and international affairs; rubber and miscellaneous plastic products; fabricated metal products; printing, publishing, and allied industries; transportation equipment; and tobacco products. A complete ranking of industrial sectors reporting on-site TRI releases is in Appendix K-1.

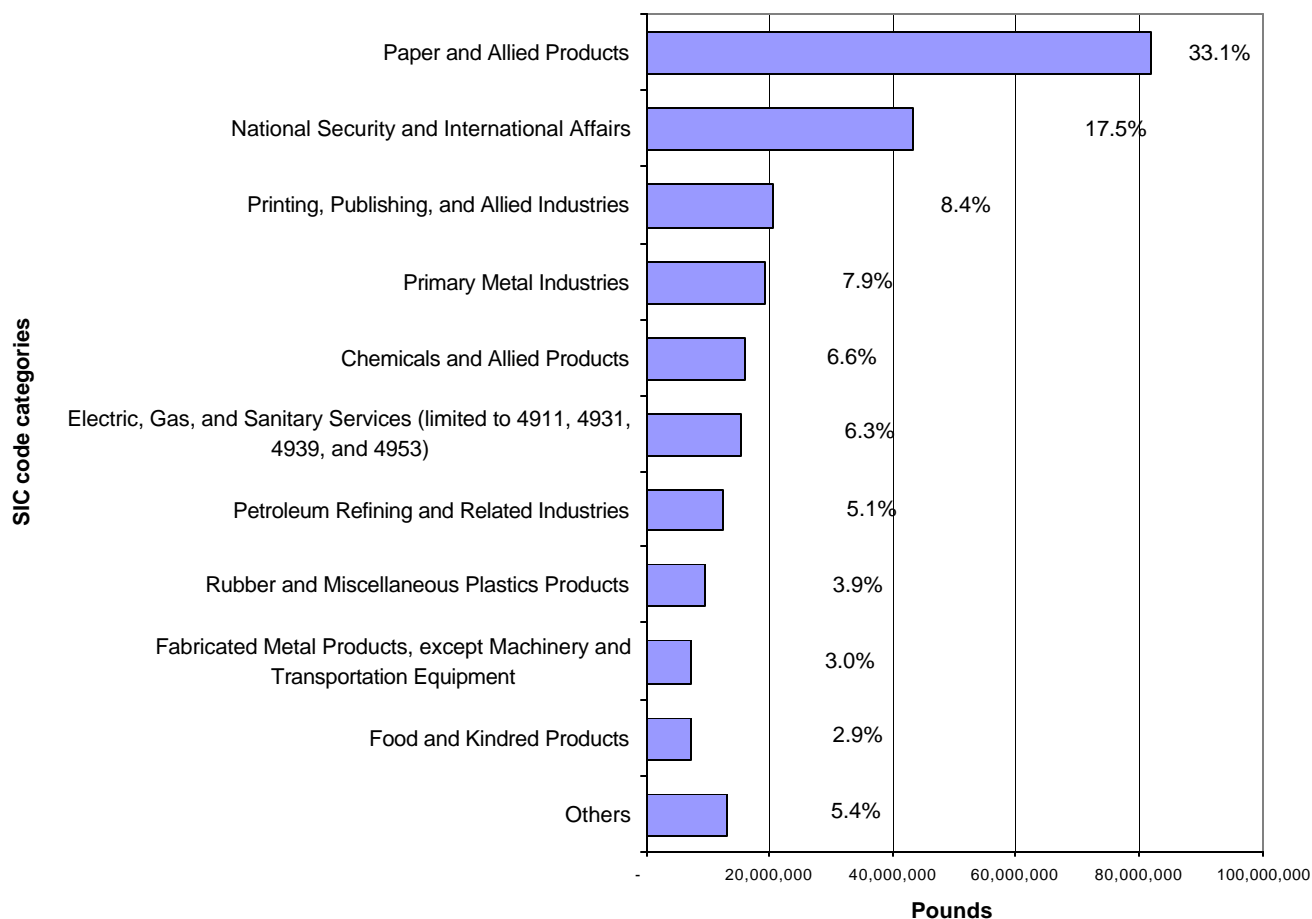
Figure 10. Top 10 Reporting Industrial Sectors (based on SIC codes) Releasing TRI Chemicals On-Site in Virginia for 2004 (from Section 5 of the Form R. The number next to each bar is the % of total on-site releases for all 2004 chemicals reported.)



Industrial Sectors Reporting On-Site Management of TRI Chemicals

The three industrial sectors reporting the most on-site management of TRI chemicals for 2004 based on the primary Standard Industrial Classification (SIC) Code, were: paper and allied products; national security and international affairs; and printing, publishing and allied industries. These three sectors contributed to 59% of the total of on-site management of TRI chemicals. The remaining top ten reporting industrial sectors for 2004 were: primary metal industries; chemicals and allied products; electric, gas, and sanitary services; petroleum refining and related industries; rubber and miscellaneous plastics products; fabricated metal products; and food and kindred products. A complete ranking of industrial sectors reporting on-site TRI management is in Appendix K-2.

Figure 11. Top 10 Reporting Industrial Sectors (based on SIC codes) Managing TRI Chemicals On-Site in Virginia for 2004 (from Section 8 of the Form R. The number next to each bar is the % of total of on-site management for all 2004 chemicals reported. This figure does not include the data extracted and re-aggregated from Sections 5 and 6 of Form R.)



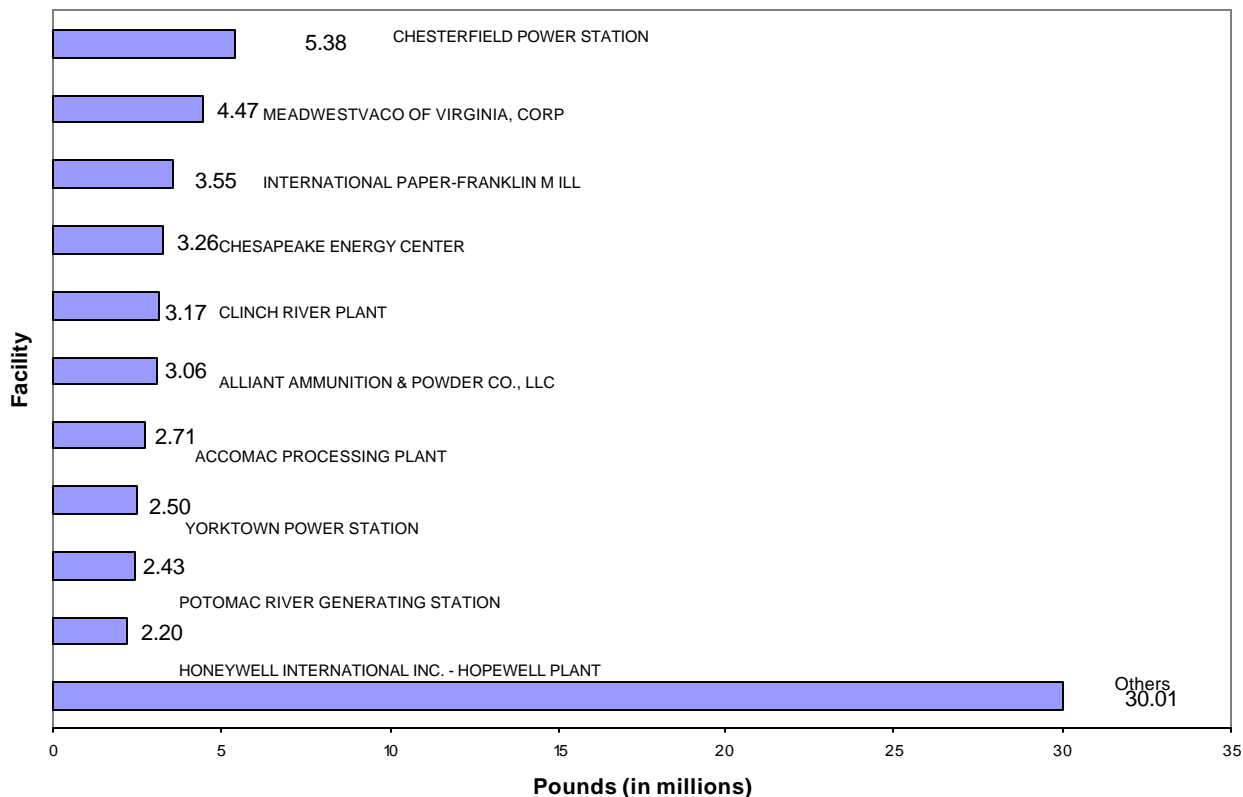
Facilities Reporting On-Site Releases of TRI Chemicals

Virginia facilities that reported the highest contributions to the on-site release of TRI chemicals to the air (fugitive and stack), water, and land in 2004 were:

- Chesterfield Power Station - 500 Coxendale Road, Chester, Chesterfield County
- MeadWestvaco of Virginia, Inc. - 104 E. Riverside St, Covington, Alleghany County
- International Paper - Franklin Mill - 34040 Union Camp Drive, Franklin, Isle of Wight County
- Chesapeake Energy Center - 2701 Vepco Street, Chesapeake City
- Clinch River Plant - Junction of State Rte 664 & 665, Cleveland, Russell County
- Alliant Ammunition & Powder Plant - government owned, contractor operated (GOCO) - Route 114, Radford, Montgomery County
- Accomac Processing Plant – 22520 Lankford Highway, Accomac County
- Yorktown Power Station. – 1600 Waterview Road, Yorktown, York County
- Potomac River Generating Station - 1400 North Royal Street, Alexandria City
- Honeywell International, Inc. Hopewell plant - Route 10 & Industrial Street, Hopewell City

These facilities accounted for 51.1% (33.1 million pounds) of all reported TRI releases to these media for 2004. Of the ten facilities, four are power generation facilities, two are paper and allied products facilities, two are chemical and allied products facilities, one is a commercial printing (gravure) facility, and one is a federal facility. Figure 12 shows the quantity of TRI chemicals each of these facilities released in Virginia in 2004. See Appendix L-1 for a complete ranking of on-site releases by facility.

Figure 12. 2004 Top Ten Virginia Facilities Reporting Releases of TRI Chemicals On-Site (from Section 5 of the Form R. The number next to each bar is the total on-site releases (in millions of pounds) for each facility.)



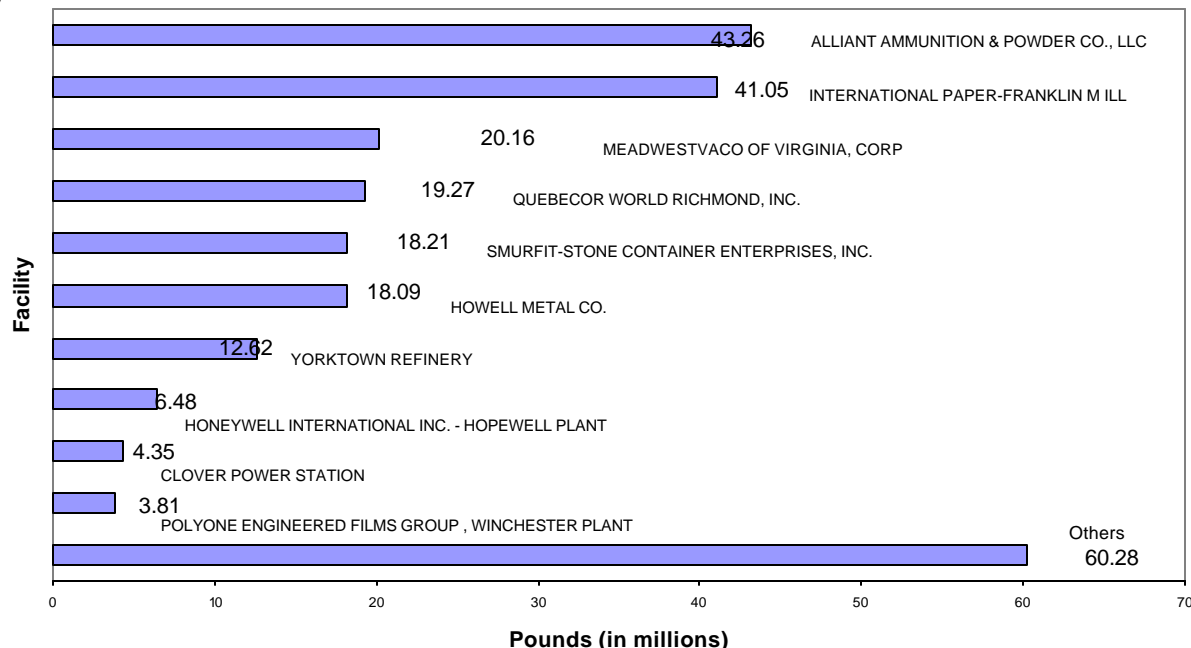
Facilities Reporting On-Site Management of TRI Chemicals

Figure 13 shows the ten Virginia facilities reporting management of the greatest quantity of TRI chemicals on-site in 2004, other than releases. These facilities were:

- Alliant Ammunition Plant - government owned, contractor operated (GOCO) - Route 114, Radford, Montgomery County
- International Paper - Franklin Mill - 34040 Union Camp Drive, Franklin, Isle of Wight County
- MeadWestvaco of Virginia, Inc. - 104 E. Riverside St, Covington, Alleghany County
- Quebecor World Richmond, Inc. - 7400 Impala Dr., Henrico County
- Smurfit Stone Container, Inc. - 19th and Main St., King William County
- Howell Metal Company - 574 Depot Rd., New Market, Shenandoah County
- Yorktown Refinery - 2201 Goodwin Neck Rd., Grafton, York County
- Honeywell International, Inc. Hopewell Plant - Route 10 & Industrial Street, Hopewell City
- Clover Power Station - Route 92, Halifax County
- Polyone Engineered Films Group - 1944 Valley Ave, Frederick County

These facilities accounted for 59.4% (147.23 million pounds) of all reported on-site management (other than releases) in 2004. Figure 13 shows the quantity of TRI chemicals each of these facilities managed on-site in Virginia in 2004. Of the ten facilities, two are paper and allied products facilities; two are chemical and allied products facilities; one is commercial printing (gravure) facility; one is a federal facility; two are stone, clay, glass, concrete facilities; one is a primary metal industry; and one is a petroleum refinery. See Appendix L-2 for a ranking of on-site management by facility.

Figure 13: 2004 Top Ten Virginia Facilities Managing TRI Chemicals On-Site, Other than Releases (from Section 8 of the Form R. The number next to each bar is the total on-site management (in millions of pounds) for each facility. This figure does not include the data extracted and re-aggregated from Sections 5 and 6 of Form R.)



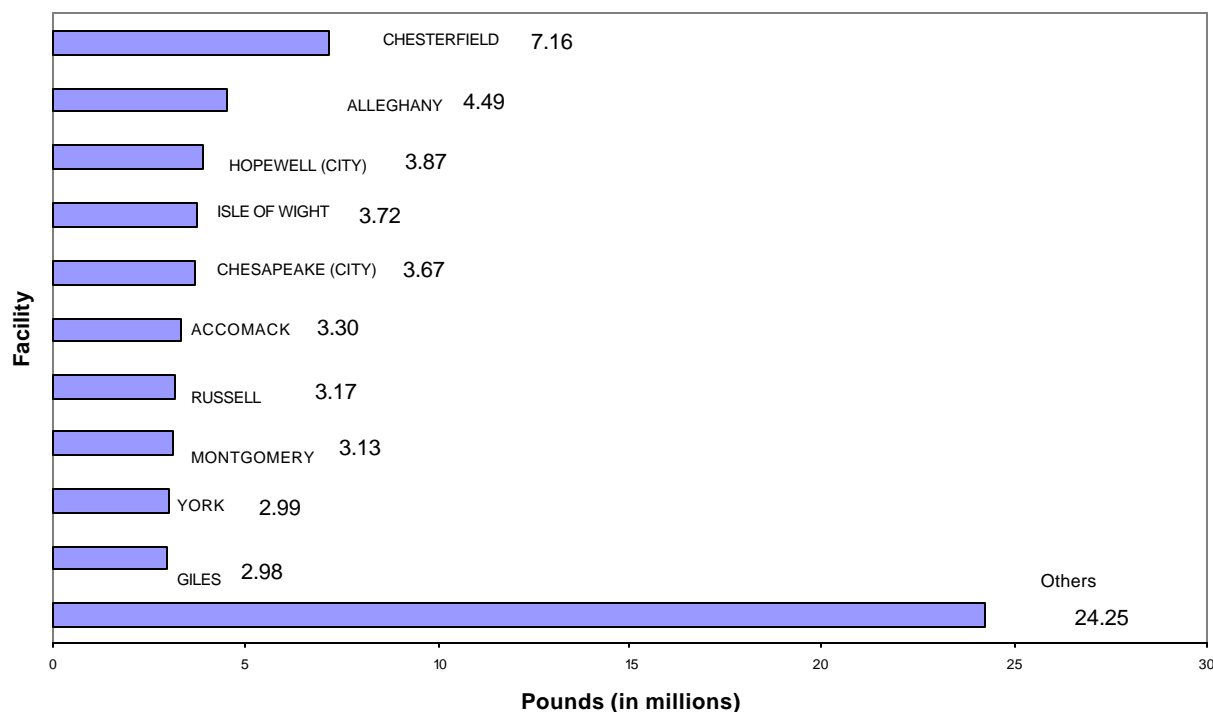
Part Three - Jurisdictions

Jurisdictions with Facilities Reporting On-Site Releases of TRI Chemicals

The Virginia jurisdictions (counties and independent cities) with facilities having the largest reported amount of total TRI chemicals released on-site to the environment (air, water, and land) in 2004 were as follows: Chesterfield County; Alleghany County; Hopewell (city); Isle of Wight; Chesapeake (city); Accomack County; Russell County; Montgomery County; York County, and Giles County. The reported on-site releases occurring within these jurisdictions comprised 61.3 % (38.5 million pounds) of the total TRI chemicals released on-site into the Virginia environment by Virginia facilities.

Appendix M-1 of this document contains a ranking of jurisdictions by the on-site releases of facilities located there. Furthermore, Appendices H and I contain detailed information about facilities located in these jurisdictions.

Figure 14. 2004 Top Ten Virginia Jurisdictions with the Largest Amount of On-Site TRI Releases Reported by Facilities: from Section 5 of the Form R. The number next to each bar is the total on-site releases (in millions of pounds) for each jurisdiction.



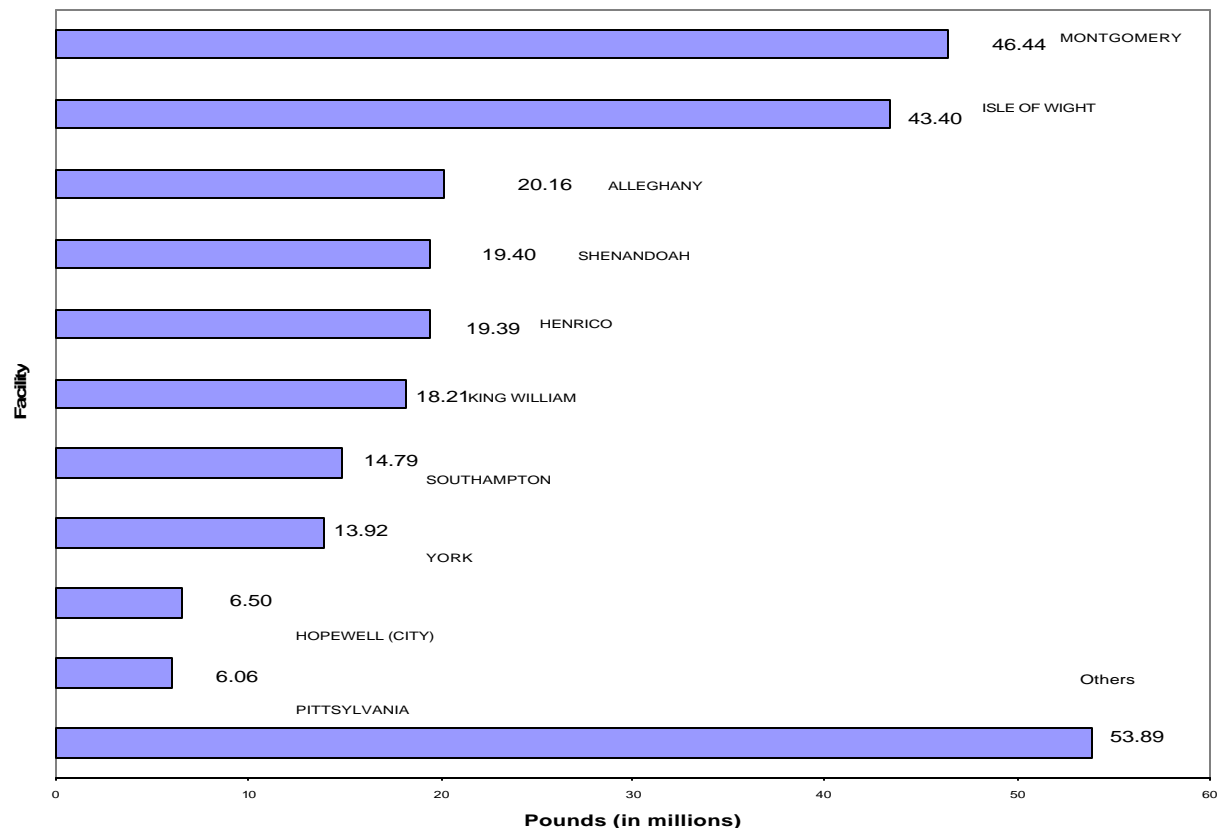
Jurisdictions with Facilities Reporting Other On-site Management of TRI Chemicals

The Virginia jurisdictions with facilities having the largest amount of total reportable TRI chemicals managed on-site (other than releases) were: Montgomery, Isle of Wight, Allegheny County, Shenandoah County, Henrico County, King William County, Southampton County, York County, Hopewell (city), and Pittsylvania County. The on-site management of these chemicals in these jurisdictions comprised 84.2% (208.27 million pounds) of total TRI chemicals managed on-site (other than releases) by reporting facilities in Virginia.

Appendix M-2 of this document contains a ranking of jurisdictions by the on-site management of facilities located there. Furthermore, Appendices H and I contain detailed information about facilities located in these jurisdictions.

Figure 15. 2004 Top Ten Virginia Jurisdictions with the Largest Amount of TRI Chemicals

Managed On-Site as Reported by Facilities: (from Section 8 of the Form R. The number next to each bar is the total on-site management (in millions of pounds) for each jurisdiction. This figure does not include the data extracted and re-aggregated from Sections 5 and 6 of Form R.)



CHAPTER FOUR - VIRGINIA TRI HISTORICAL COMPARISON

Since its inception, the TRI program has been expanding and evolving, providing more information to the public about the presence and release of toxic and hazardous chemicals in communities. Over the past 15 years, various regulatory changes have occurred (see Appendix D). In addition, facilities are authorized to revise reports from previous years. This makes direct comparison of current data to historical reports difficult and potentially misleading. Appendix G provides further information about the changes in reporting requirements, and sets out limited historical data that have been standardized.³

Nevertheless, reporting years 2002, 2003, and 2004 are generally comparable, and Chapter Four presents data for those three years. All revisions for those reporting years received on or before December 15, 2005 have been incorporated into this chapter. It should be noted, however, that beginning with reporting year 2001, lead and lead compounds were re-designated as PBT chemicals, and the threshold for reporting was reduced to 100 pounds. This caused facilities to submit significantly more reports for lead and lead compounds for reporting years 2001 through 2004.

Table 6 compares TRI data for reporting years 2002 to 2004 by type of release, transfer, and on-site management.

For reporting year 2004, the total amount for each of the subcategories (on-site releases, off-site transfers, and on-site management) shows a decrease from the corresponding amount for reporting year 2003. From 2003 to 2004 the total TRI chemicals released on-site, transferred off-site, or managed on-site decreased by 1.17%.

The most noticeable changes seen for the on-site releases in this table are the 10.70% increase in on-site water discharge from 2002 to 2004; a decrease in land disposal (6.04%); and a decrease in the overall on-site releases to the environment (at 11.56%).

Table 6 also shows that the transfers of TRI chemicals to off-site facilities for further management or disposal also decreased in 2004. Most notable for the 2004 reporting were the significant decreases in the usage of POTWs (16.81) and other treatment options (33.56); and increases of other off-site transfer options (including a 20.07% increase in energy recovery options), as compared to 2003 data. The overall quantities of TRI chemicals transferred off site decreased by 1.36% for 2004.

The overall quantities of TRI chemicals managed on-site, through treatment, recycling, or energy recovery, decreased by 0.6%, including a (14.0%) decrease in on-site energy recovery.

Longer term trends can be seen in the last column of Table 6. Over the three years, on-site releases of TRI chemicals decreased 11.56%, off – site transfers decreased by 7.05%, and on-site management increased 12.56%. Over the three years 2002 through 2004, Virginia facilities reported a 4.05% increase in the release, transfer, or other management of TRI chemicals.

³ The information in Appendix G is historical and is for general comparison only. Unlike Chapter Four, Appendix G does not include revisions received between January 14, 2005 and December 14, 2005.
Virginia TRI Report – Summary of Data
from 2004 Facility Reports (issued March 2006)

Table 6. Comparison Summary Data by Type of Release, Transfer, and On-Site Management for TRI Chemicals for 2002, 2003, and 2004 (from Table 1)

MANAGEMENT ACTIVITIES	YR 2002 (POUNDS)	YR 2003 (POUNDS)	YR 2004 (POUNDS)	CHANGES 2003-2004	% CHANGE 2003-2004	%CHANGE 2002-2004
ON-SITE RELEASES						
AIR(TOTAL)	56,697,327	50,962,772	47,972,931	-2,989,841	-5.87%	-15.39%
FUGITIVE AIR	6,398,400	5,239,126	5,067,800	-171,326	-3.27%	-20.80%
STACK AIR	50,298,926	45,723,646	42,905,131	-2,818,515	-6.16%	-14.70%
WATER	8,262,382	8,199,535	9,146,470	946,935	11.55%	10.70%
LAND	5,973,504	5,651,581	5,612,934	-38,647	-0.68%	-6.04%
UNDERGROUND INJECTION WELLS	0	0	0	0	0.00%	0.00%
TOTAL	70,933,213	64,813,888	62,732,335	-2,081,553	-3.21%	-11.56%
OFF-SITE TRANSFERS						
POTW	17,327,431	18,771,839	15,616,396	-3,155,443	-16.81%	-9.87%
OTHER OFF-SITE TRANSFERS (TOTAL)	51,534,164	46,114,495	48,389,359	2,274,864	4.93%	-6.10%
RECYCLING	29,444,576	22,063,770	22,706,888	643,118	2.91%	-22.88%
ENERGY RECOVERY	11,597,088	11,792,758	14,159,015	2,366,257	20.07%	22.09%
OTHER TREATMENT	2,030,466	2,723,642	1,809,680	-913,962	-33.56%	-10.87%
DISPOSAL	8,5462,033	9,534,325	9,713,777	179,452	1.88%	14.79%
TOTAL	68,861,595	64,886,334	64,005,755	-880,579	-1.36%	-7.05%
ON-SITE MANAGEMENT						
TREATED ON-SITE	89,257,903	125,280,332	137,665,290	12,384,958	9.89%	15.98%
RECYCLED ON-SITE	83,248,394	105,170,428	93,879,346	-11,291,082	-10.74%	12.77%
ENERGY RECOVERY ON- SITE	47,264,002	18,410,731	15,832,947	-2,577,784	-14.00%	-66.50%
TOTAL	219,770,299	248,861,491	247,377,583	-1,483,908	-0.60%	12.56%
GRAND TOTAL	359,565,107	378,561,713	374,115,673	-4,446,040	-1.17%	4.05%

Table 7 compares, in detail, the TRI data for PBT Chemicals by type of release, transfer, and on-site management for reporting years 2002 to 2004. From 2002 to 2004, the total of PBT chemicals released on-site, transferred off site, or managed on-site increased by 5.16%.

The chemical management options within the off-site transfers show much more of a cyclic pattern. More noticeably for the 2004 reporting were the increases in the usage of off-site facilities for recycling, energy recovery, and disposal options, as compared to 2003 data. In the on-site management portion of the data comparison, again, within the on-site management options, the data shows more of a cyclic pattern from one year to another.

Table 7. Comparison Summary Data by Type of Release, Transfer, and On-site Management for PBT chemicals for 2002 and 2004 (from Table 1)

MANAGEMENT ACTIVITIES	YR 2002 (POUNDS)	YR 2003 (POUNDS)	YR 2004 (POUNDS)	CHANGES 2003-2004	% CHANGE 2003-2004	%CHANGE 2002-2004
ON-SITE RELEASES						
AIR(TOTAL)	45,247	43,431	29,650	-13,781	-31.73%	-34.47%
FUGITIVE AIR	6,748	5,918	6,969	1,051	17.76%	3.28%
STACK AIR	38,499	37,513	22,681	-14,832	-39.54%	-41.09%
WATER	1,565	1,892	2,625	733	38.74%	67.73%
LAND	317,946	342,439	275,457	-66,982	-19.56%	-13.36%
UNDERGROUND INJECTION WELLS	0	0	0	0	0.00%	0.00%
TOTAL	364,758	387,762	307,734	-80,028	-20.64%	-15.63%
OFF-SITE TRANSFERS						
POTW	1,036	887	676	-211	-23.79%	-34.75%
OTHER OFF-SITE TRANSFERS (TOTAL)	1,617,130	1,345,378	1,776,242	430,864	32.03%	9.84%
RECYCLING	1,168,578	883,471	1,155,493	272,022	30.79%	-1.12%
ENERGY RECOVERY	231	2,928	1,296	-1,632	-55.74%	461.04%
OTHER TREATMENT	13,137	10,157	15,605	5,448	53.64%	18.79%
DISPOSAL	435,184	448,822	603,848	155,026	34.54%	38.76%
TOTAL	1,618,166	1,346,265	1,776,918	430,653	31.99%	9.81%
ON-SITE MANAGEMENT						
TREATED ON-SITE	115	46	17.5	-29	-61.96%	-84.78%
RECYCLED ON-SITE	22,281	35,108	23,805	-11,303	-32.19%	6.84%
ENERGY RECOVERY ON- SITE	0	0	311	311	0.00%	0.00%
TOTAL	22,396	35,154	24,133	-11,021	-31.35%	7.76%
GRAND TOTAL	2,005,320	1,769,181	2,108,786	339,603	19.20%	5.16%

CHAPTER 5 - CONCLUSION

The 2004 Virginia TRI Report is issued under mandate of state law. The report has information on chemicals and chemical categories, activities involving their use, industrial sectors, facilities, and facility locations (jurisdictions). It provides historical perspective on TRI chemicals in the Commonwealth.

The report provides the public with information concerning listed toxic chemicals and chemical categories that are manufactured, processed, or otherwise used at Virginia facilities, including amounts released to the environment, transferred off-site, and managed on-site. Industry can use the data in a variety of ways, including a measurement of its progress toward reduction targets.

There are limitations on the use of TRI data, especially with regard to assessment of risk and the comparison of data for various years.

Since 1988, the amount of TRI chemicals released or otherwise managed has historically decreased. The data for reporting year 2004 also show a decrease in the amount of TRI chemicals released on-site, transferred off-site, and managed on-site, based on the latest reports and revisions. At this time, it is not possible to predict with confidence whether these trends will continue.

All parts of the agency and other sectors of government, all Virginia businesses and industry, and all Virginia's citizens have a role in managing and controlling the release of toxic chemicals in the Commonwealth. This report assists these entities with monitoring toxic chemicals that are manufactured, processed, and used at Virginia facilities.